The following is from the March, 1887, report of the "Tennessee Weather Service:"

The percentage of verifications of weather and temperature predictions were: for Nashville, weather 100 per cent., temperature 87.1 per cent.; for Clarksville, weather 85.2 per cent., temperature 66.6 per cent.

The following is from the "Bulletin of the New England Meteorological Society" for March, 1887:

Verification of weather signals at New Haven was 92 per cent. for temperature, 87 for weather. At Nashua the 1 a. m. predictions had a local verification of 71 per cent. and the 10 a. m. predictions of 54.8 per cent.

STATE WEATHER SERVICES.

The following is an extract from the March, 1887, report of the "Alabama Weather Service," P. H. Mell, jr., of the Agricultural and Mechanical College, Auburn, director:

The very small precipitation has made the month remarkable. The average amount of rain was 5.36 inches below the normal. Even at those stations where records have been kept for a number of years such a small precipitation has not been given in any previous March. Slight falls of snow were reported by several observers, too meagre, however, to measure.

The temperature was 4°.4 below the normal for March, and colder by 2°.2 than the average for February of this year. Frosts were frequent throughout the month, and considerable damage was done to fruit and early vegetables. In the northern portion of the state the fruit is reported as entirely destroyed. The sudden changes in temperature were very serious drawbacks to market gardening, and large losses have been sustained.

Summary.

Mean temperature, 54°.6; highest temperature, 80°.0, at Eufaula and Newton, on the 6th, and at Livingston on the 4th; lowest temperature, 19°, at Gadsden, on the 19th; range of temperature, 61°; greatest monthly range of temperature, 59°, at Gadsden; least monthly range of temperature, 40°, at Fayette; mean daily range, 18°; greatest daily range, 46°, at Gadsden, on the 2d; least daily range of temperature, 0°, on the 17th, at Greensborough, and at Union Springs on the 13th.

Mean depth of rainfall, 1.97 inches; mean daily rainfall, 0.064 inch; greatest depth of monthly rainfall, 4.07 inches, at Tuscumbia; least depth of monthly rainfall, 0.07 inch, at Troy.

Average number of days on which rain fell, 4; average number of cloudy days, 6; average number of fair days, 10; average number of clear days, 16.

Warmest days, 4th, 6th, 13th, and 26th; coldest day, 29th.

Prevailing direction of wind, northwest.

The following is an extract from the March, 1887, report of the "Arkansas Weather Service," Mr. George R. Brown, of Little Rock, director:

Hail storms were reported from Searcy and Fayetteville on the 26th; Little Rock, Palarm, and Monticello the 27th; and Palarm 30th. Snows, at Fayetteville, Eureka Springs, and Conway the 28th.

Heavy rains at Conway 5th and Searcy 26th. The heaviest rain and most general of the month was on the 6th. Reports from nearly all portions of the state, and the stations at Cairo, Ill., Memphis, Tenn., and Shreveport, La., show the average for that day to be from one to three inches.

Two cool waves passed over the state, on the 3d and and 18th, doing but little damage, and in most places not cold enough for a frost. The cold wave of the 27th, 28th, and 29th was more severe and did great damage to fruits and early vegetables. At Judsonia the temperature was 10° below freezing on the 29th, and ice a quarter of an inch thick.

Frosts were reported from Russellville 2d, 22d, and 29th; Palarm, Cairo, Ill., Shreveport, La., 22d; and generally on the 23d 28th, and 29th, with ice at most places even as far south as Helena and Monticello.

The highest observed temperature was 88°.0 at Fayetteville University, and the lowest 24°.0 at same place.

The rainfall throughout the state has been from one-half to one and a half inches less than usual, while the mean temperature is from one to four degrees above the average of March.

The following extracts are from the March, 1887, "Monthly Review of the Illinois Weather Service," Col. Charles F. Mills, of Springfield, director:

The month of March was, all things considered, very pleasant. There was an absence of the fierce storms of winter, high winds, and heavy drifting snows that tend to make it, climatically, the least favored of the winter months. The meterological conditions were reversed, in that the first part of the month was warm and spring-like, while the last few days were marked by the occurrence of the only severe cold-wave and heavy snowfall (the latter in the southern counties only).

Five areas of high pressure and seven of low pressure passed over the state during the month. Of the former, that of the 4th was the most marked, and of the latter that of the 24th, neither being remarkable for extremes. The range of pressure was greatest in the northern and least in the southern part of the state.

Temperature.—The temperature was normal for the month, being slightly below in the northern and central counties, and slightly above in the southern.

The highest temperatures occurred on the 12th in the northern and central counties, and on the 1st and 2d in the southern counties.

The lowest temperature occurred on the 28th and 29th throughout the state, ranging from —7° in Jo Daviess county to 24° in Alexander county.

The mean daily range of temperature was about 2° above the March normal for the past six years.

The mean temperature of the month for the state, 37°.6, was exactly the March normal for tne past thirteen years. March, 1877, with a mean temperature of 31°.5, being the coldest, and March, 1880, with a mean temperature of 48°.0, being the warmest on record. The mean temperature of the northern counties was 31°.8; of the central, 38°.1, and the southern, 43°.6.

The lowest monthly mean temperature reported was 23°.6, from Lake Forest, Lake Co., and the highest, 47°.9, from Cairo, Alexander Co., making a range of 24°.3 from the extreme northern to the extreme southern portion of the state, or a rise of about 1° in the mean temperature for every sixteen miles traversed going south.

Precipitation (inches).—General precipitation fell on six days, the amount deposited being very light in the northern counties, nearly an inch below the normal in the central, and about the average in the southern. Excessive rainfall (over four inches) was reported from Marion and Clay counties on the 5th. A heavy snowfall was reported from the same section on the 30th.

The average precipitation for the state for the month, 2.27, was 0.39 below the March normal for the past ten years. March, 1882, 4.47, being the greatest, and March, 1885, 0.51, the least monthly precipitation on record. The average for the northern counties, 1.02, was 1.21 below; for the central counties, 1.70, was 0.87 below, and for the southern counties, 4.19, was 1.02 above the March normal for the past ten years.

The average snowfall for the state for the month was 6.1, exactly the March normal for the past four years; for the northern counties, 6.2; central, 4.3, and southern, 7.4. The greatest monthly snowfall reported was 17.0, from Richland county; the least, 1.0, from Pope county. A heavy snowfall, aggregating 12 inches, occurred in the south-central part of the state on the 30th (about the same section that had the heavy rainfall on the 5–6th); the northern boundary of this snow storm reached to the central part of the state. But little of this snow remained on the ground on a. m. of April 1st.

The prevailing direction of the wind was from the northwest. The maximum velocity was from forty to fifty miles per hour from the west on the 24th, caused by the rapid movement of an area of low pressure moving northeastward through the Saint Lawrence Valley.

The cold waves were few and none severe. That of the 28–29th covered the entire section of country east of the Mississippi River.

The following is an extract from the March, 1887, "Bulletin of the Colorado Meteorological Association," Prof. F. H. Loud, of Colorado Springs, director:

The March weather has been remarkably pleasant, being warm, and, to a great degree, free from the wind-storms which prevailed in February. The rainfall in most sections was also light. At Denver, as will be seen by the annexed table, the five lowest March rainfalls on record (including that of the present year) differ but slightly from one another, while the mean temperature for last March is but one-tenth of a degree below the highest which is recorded, that of 1879.

Table of temperature and precipitation at Denver and Colorado Springs for March during sixteen years.

Year.	Denver.		Colorado Springs.		Year.	Denver.		Colorado Springs.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	°	Inches.	°	Inches.		°	Inches.	°	Inches.
1872	36.3	1.71	35.4	1.15	1880	34.2	0.21	.....	0.59
1873	44.0	0.22	41.9	0.19	1881	37.6	0.87	.....	.....
1874	36.3	0.49	34.5	0.50	1882	43.2	0.20	.....	.....
1875	33.3	0.39	30.4	1.12	1883	43.8	0.21	39.6	.....
1876	34.7	1.80	33.5	0.13	1884	39.0	0.93	36.4	.....
1877	42.8	1.40	.....	.....	1885	38.5	0.97	38.6	.....
1878	45.5	1.82	.....	.....	1886	33.5	2.36	34.0	0.39
1879	46.0	1.00	44.2	0.73	1887	45.9	0.23	43.4	0.19

The following is an extract from the March, 1887, report of the "Indiana Weather Service," Prof. H. A. Huston, of Purdue University, Lafayette, director:

The mean temperature was about normal over the greater part of the state, the greatest departure being 3°.9 below at Logansport. The warmest day was the 2d, and the coldest the 29th. The highest temperature was 78° at Marengo, and the lowest 8° at Angola.

Precipitation was mostly below the normal, except at Worthington where it was 1.36 inches above, and at Sunman where it was 1.13 inches above. A very heavy snow storm occurred in the southern portion of the state on the 30th and 31st, fourteen inches being reported from some stations. Thunderstorms were reported on the 5th, 9th, and 27th.

The observer at Princeton, Gibson Co., reports that on the morning of the 6th, after a heavy rainfall the previous night, the ground was thickly covered with yellow dust resembling sulphur. The quantity was so great that in some places it had gathered in drifts like snow. This dust extended over the entire county, and was believed to be the pollen of the southern pines which had been caught up and carried along by the wind. The observer at Angola reports that, owing to the lack of snow, the wheat crop in his neighborhood is considerably injured by the frost.

The following is an extract from the report of the Michigan State Board of Agriculture for March, 1887. The state weather service is in charge of N. B. Conger, Sergeant, Signal Corps:

Temperature.—The mean temperature for the state for March, 27°.6, is the same as the mean obtained from a series of readings extending from five years at Mackinaw City to nineteen years at the Agricultural College.

The mean temperature for the central counties, as obtained from the mean temperature for this month at Port Huron, Agricultural College, and Grand Haven, is 30°.1.

The absolute range of temperature for the state is 78°.5. The maximum temperature, 64°, at Cassopolis, and the minimum temperature, —14°.5, at Grayling. The greatest range of temperature at any station was 67°, at Grayling, and the least range was 41°.4, at Saginaw City.

Prof. R. C. Kedzie, of the Agricultural College, who has a continuous record for the last twenty-four years, furnishes the following means, obtained from observations made at the college: Mean temperature, 31°.46; mean barometer, 28.933; mean rainfall, 2.63 inches. As these observations extend over nearly a quarter of a century they are reliable for the mean of central Michigan.

Precipitation.—The precipitation has been below the normal about 0.96 inch in the state. The maximum rainfall, 3.00 inches, at Port Huron, and the minimum rainfall, 0.22 inch, at Mackinaw City. The central part of the state received the highest average precepitation, while the northern and southern portions are below the normal from 1.00 to 1.12 inches. The average number of rainy days is but 7.3. On the 5th instant rain fell, which continued until the morning of the 6th, and melted what snow there was on the ground, leaving it bare throughout the central and southern portions of the state. Snow fell on the 13th, but melted as rapidly as it fell.

The snow that fell on the 21st and 22d, lay in some portions two inches deep on the level.

The snow of the 24th, which began in the afternoon, was remarkable for the size of the flakes, which in several instances were carefully measured and found to be two and a half inches long by one and three-fourths inches wide. These heavy flakes fell for fully thirty minutes, when they became smaller. The snow storm of the 27th left a covering of snow on the ground of from 2 to 4 inches.

The total snowfall in the state ranges from 2.0 inches to 11.5 inches. The precipitation along the peach belt of west Michigan has been light.

The growth of the weather signal stations has been very gratifying, as sixty stations have been established since January 1st.

Three cold-wave signals were ordered during the month, and were all justified by the anticipated fall of 15° to 25°. The signals were ordered from twelve to thirty-six hours in advance of the wave.

The following extracts are from the March, 1887, report of the "New England Meteorological Society," Prof. Wm. H. Niles, of the Institute of Technology, Boston, Massachusetts, president:

Reports for the month were received from one hundred and forty-four observers.

The average precipitation for the month for thirty-two stations was somewhat in excess of normal; the excess was most distinct in Massachusetts, where thirteen stations average 1.11 inches above their normal, while eight stations in southern New England had an average deficiency of 0.23 inch. During, and at the end of, the month the snow in northern New England was exceptionally deep. The mean temperature for the month at twenty-five stations averaged 2°.6 below the normal.

The weather of the month was controlled by seven cyclonic storms; four of these, on the 2d, 7th, 25th, and 28th, passed down the Saint Lawrence Valley; two came from the south, passing along our coast on the 10th and 22d; one apparently crossed from the Lakes over northern New England and lingered nearly a week off-shore, from the 14th to 20th, the anti-cyclones preceding and following it passing by on the 12–13th and 21st.

March opened with clear, quiet, cold weather, under an anti-cyclone, giving a low morning minimum that was at many stations the lowest of the month (5° to 15° in the south, 0° to 24° in the north); but in the afternoon clouds appeared in advance of a weak cyclonic storm that passed over Canada on the 2d, giving us higher temperature, halos, and some cloudiness, but very little precipitation. The weather then remained fair up to the 5th, when a strong anti-cyclone (30.8 inches) gave a second low morning minimum, the lowest of the month for nearly all stations that had not already had their lowest temperature on the 1st (5° to 15° in the south, —10° to 33° in the north). In the White Mountain region a strong inversion of temperature accompanied this rapid nocturnal cooling, as appears from the following list of noon maxima on the 4th and morning minima on the 5th; the Gorham record is from a Draper thermograph:

	Max.	Min.	Fall.		Max.	Min.	Fall.
	°	°	°		°	°	°
Mount Washington	1	—15	16	Berlin Mills	38	—29	67
Stratford	38	—21	59	Gorham	30	—15	45
West Milan	38	—33	71	Shelburne	36	—23	59

As this anti-cyclone moved off the coast, and while the next succeeding cyclonic centre was still in the far northwest, there was a rapid fall of pressure to about thirty inches, causing a heavy and unexpected snow storm, beginning with easterly winds about 18h. to 20h. on the 5th and continuing over night till morning or about noon of the 6th, and yielding when melted one to two inches of water; in the south the snow generally changed to rain on the morning of the 6th. During the snow storm the temperature stood at most stations between 15° and 30°, rising to between 20° and 40°, with small diurnal variations during the cloudy 7th; but as the cyclonic centre passed eastward over Canada and the pressure began to rise about midnight of the 7th the temperature fell, preparatory to marked diurnal variation under the clear anti-cyclone of the 8th and 9th; the noon maximum of the 8th and the morning minimum of the 9th differed by more than forty degrees at many of the northern interior stations.

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The Hampshire Natural History Society has established a number of thermometer stations in Northampton, Mass., at points about a quarter of a mile apart, and all within a mile of the post-office; the following abstract from the records for March is furnished by the secretary of the society, Mr. W. R. Jones:

Station.	Altitude above sea.	Maximum temperature.			Minimum temperature.			Monthly mean.
		Mean.	Absolute.	Date.	Mean.	Absolute.	Date.	
	Feet.	°	°		°	°		°
Paradise Road	182	38.0	52	21	19.5	7	1	28.7
Green Street	150	39.2	52	13, 20	20.8	0	5	30.0
Maple Street	125	38.9	49	14, 19	19.1	—2	5	29.0
Round Hill	285	35.8	49	21	22.2	7	5	29.0
Holyoke Street	135	37.4	47	21	19.1	2	5	28.2
North Street	125	35.7	47	21	18.2	—2	5	27.0
Munroe Street	140	39.1	48	19	18.4	—3	5	28.8
North Prospect Street	195	37.7	50	21	20.4	2	5	29.0
Prospect Street	182	39.5	51	25	21.0	3	5	30.2

The following is an extract from the March, 1887, report of the "Minnesota Weather Service," Prof. Wm. W. Payne, Carleton College, Northfield, director:

The month was characterized by a deficiency in precipitation, a temperature slightly below the normal, and twenty-two days on which the weather was either fair or clear.

Temperature.—The mean was 25°.5, which is 1°.3 below that of the corresponding month of 1886 and 1°.3 above that of 1885. Cold waves passed over the state on the 3d and 4th, and 24th and 25th; during the prevalence of the former the minimum temperature of the month occurred. Some of the lowest were Saint Vincent, —27°.0; Grand Forks, —22°; and Moorhead, —19°.2. The mild weather, which generally prevailed from the 6th to the 23d, caused the snow to rapidly disappear. The maximum temperature for the month was 65°.9, and occurred at La Crosse on the 12th; the next highest was 61° at Winona on the same day. The temperature was 3° below the average of seventeen years in the northeastern portion of the state, and 1° below in the southeastern portion, while in the northwestern portion it was 2° above the average of fourteen years. North of latitude 45° 30′, the temperature was 2° below that of the corresponding month of last year, while to the south is was not quite 1° below. The monthly range of temperature for the state was 92°.9, which is exceptionally great; this is 14° above the range of 1886, and 20° above that of 1885. The greatest ranges reported were 77° at Grand Forks, and 72° at Saint Vincent; the least ranges were 53° at Spring Valley, and 53°.6 at Mankato.

Precipitation (in inches).—The average for the state was 0.34, which is considerably below the normal, and 0.75 below that of the corresponding month of 1886. The precipitation was mainly in the form of snow, and occurred during the periods of the 5th to 8th (inclusive), 19th and 20th, 22d to 24th, 29th and 30th. No station reported as much as an inch of precipitation, while some of the greatest amounts recorded were Duluth, 0.55, Saint Vincent, 0.48, Spring Valley, 0.44, and Red Wing, 0.43; some of the smallest were Saint Cloud, 0.14, Northfield, 0,18, Winona, 0.25, La Crosse and Moorhead, 0.26. At La Crosse it was 1.32 below the average of fifteen years; Saint Paul, 1.11 below that of seventeen years; and Duluth 0.95 below that of seventeen years. The greatest amount of snow reported as having fallen was five inches at Spring Valley and Rochester. At the close of the month snow had generally disappeared, except in localities where there were severe drifts.

The following is from the March, 1887, report of the "Mississippi Weather Service," Prof. R. B. Fulton, of the University of Mississippi, Oxford, director:

Summary.

Mean temperature, 58°; highest temperature, 87°, on the 12th, at Greenville; lowest temperature, 28°, on the 30th, at Lamar and Palo Alto; monthly range, 59°. Mean monthly rainfall, 2.90 inches; greatest monthly rainfall, 5.36 inches, at Batesville; least monthly rainfall, 1.02 inches, at Waynesborough; average number of days rain fell, 6.

Frost occurred generally throughout the state, except in the extreme southern portion on the following dates: 1st 17th, 18th, 19th, 21st, 22d, 23d, 25th, 29th, 30th, 31st.

Hail occurred at Biloxi, 20th; Edwards, 27th; Jackson, 27th; Oxford, 30th.

Extracts from reports of observers.

Jackson, March 26: at 5.30 p. m. a dark cloud arose in the northwest, followed by considerable wind, rain, and very heavy hail. No damage done to crops or fruit. The thermometer fell in two hours from 78° to 48°.

Artonish Plantation: This month has been an unexceptional one—no violent storms and but very little rain.

The following is from the March, 1887, report of the "Missouri Weather Service," Prof. Francis E. Nipher, of Washington University, Saint Louis, director:

March, 1887, has had a mean temperature of 46°.1, which is 2°.4 above the normal at the central station. The highest temperature recorded was 78°.7 on the 1st, and the lowest was 26° on the 29th, both being common temperatures for March. The temperature fell to, or below 32°, on six days during the month. The rainfall and melted snow was 3.87 inches, which is very near the average, 3.74. Nearly two and one-half inches of this fell in about eighteen hours on the 5th. Snow fell on four days, viz., on the 21st, 28th, 29th, and 30th, that on the 30th being rather heavy, between three and four inches. ing on that day.

The lowest temperatures reported from the state are: 14°, at Ironton, Kirksville, and Louisiana; 16°.2, at Fayette; 18°, at Miami and Sedalia; and 19°, at Houstonia. The highest temperatures were: 85°, at Pro Tem; 80°, at Columbia, Sedalia, Steelville, and Troy; and 79°, at Oregon.

The following is from the March, 1887, report of the "Nebraska Weather Service," Prof. Goodwin D. Swezey, of Doane College, Crete, director:

The most marked feature of the weather for the month has been the great deficiency in snow which, with the corresponding deficiency for the two preceding months, has rendered the early germination of crops impossible, although the early arrival of warm weather has permitted prompt beginning of spring's work, so that farm work is well advanced.

Precipitation.—The average precipitation for southeastern Nebraska is only 0.36 inch against an average of 1.11; the average for the entire state is 0.47; the largest precipitation is, this month, in the extreme west, which is the only part of the state having over one inch. A small area in the southeast corner has over one-half an inch, while an area in the east-central portion of the state along the Platte has scarcely any, and one station near the centre of this area reports absolutely no appreciable precipitation. All this is in striking contrast with the unprecedented snowfall of last March.

Temperature.—There has been nothing marked in the temperature of the month. The mean is 1°.2 above the normal; the noon temperature is 1°.8 above the average of past Marches; the extremes have been considerable, the range being from 80° to —5°.5, the usual range being from about 70° to 5°.

Comparison of past Marches.

The table shows the mean temperature, the noon temperature, and the number of days below 32° for the past ten Marches in southeastern Nebraska; they are found by averaging the numbers reported at the different stations. It also shows the highest temperature and the lowest recorded anywhere in the state by standard self-registering thermometers:

March.	Mean temperature.	Noon temperature.	Below 32°.	Highest temperature.	Lowest temperature.
	°	°	*Days.*	°	°
1878	46.8	57.8	.....	80.0	22.0
1879	40.6	52.1	.....	86.0	1.0
1880	34.8	46.6	1.8	.....	.....
1881	29.2	37.5	0.0	51.0	4.0
1882	40.2	49.2	0.0	77.3	4.5
1883	33.6	42.2	0.1	71.0	3.0
1884	34.8	43.1	1.4	73.0	— 4.7
1885	35.7	45.8	0.0	70.2	7.0
1886	31.7	39.1	1.6	73.0	—15.0
1887	37.7	47.9	0.0	79.8	— 5.5

The following is an extract from the March, 1887, report of the "New Jersey Weather Service," Prof. George H. Cook, of the Agricultural College, New Brunswick, director:

March came in to us mild mannered, and without a hint as to its boisterous blusterings that greeted us farther on, and left us at the end of the month with snow on the ground to an average depth of one inch.

Five storm-centres were traced across the country on the Signal Service maps and several disturbances affected our weather conditions, whose centres passed along the Gulf stream in their usual northeasterly course and are not included in the above number. Suffice it to say that the storm movements were rapid and high winds followed, and that after the 10th of the month they were effective in drying up the roads and clearing away the fog, and traveling in the state became more agreeable.

The temperature for March was lower than the average March temperature for sixteen years, but still higher than the remarkably cold March of 1885, when the mean at New Brunswick was 29°.8. The mean monthly temperature for the state, as given below at eleven stations—Atlantic City, Dover, Lambertville, Moorestown, New Brunswick, New York City, Paterson, Philadelphia, Princeton, Somerville, and South Orange—when compared with the normals determined for those stations, shows an average deficiency of 3°.3. The excess of heat received in February has thus been lost in March; and, strange as it may seem, it was just 3°.3.

Frosts were quite frequent in March, and in many places exposed to the south it remained in the ground to a depth of three inches when the month closed.

The following is from the March, 1887, report of the "North Carolina Weather Service," Dr. Charles W. Dabney, jr., of Raleigh, director:

That popular and proverbial maxim relating to the month of March, "Enter as a lamb, exit as a lion," and *vice versa*, was practically illustrated in this case. The month opened balmy and spring-like, with warm, genial sunshine, high temperatures (the maximum at nearly all stations was noted on the 2d), clear skies, and general absence of rain; peach trees began to bud and leaf, fresh grass appeared, and many early garden plants burst forth in blossom. On the other hand, four of the final days were remarkable for strong winds, hoar frosts, heavy rains, snow, and sleet, with decidedly freezing weather at all points. The temperatures were generally reduced to 10° and 15° below freezing, and in the moutainous districts even 21° below freezing was recorded. It was during this period (on the 30th) that most of the observers noted their minimum for the month. The severity of this change and its general scope was, unfortunately, largely destructive to plant life. The approaching frost was duly announced by the United States Signal Service, and the cold-wave signal was hoisted at Raleigh before 11 a. m. of the 28th, nineteen hours in advance of the change. The temperature dropped 33°. Warm, cold, and equable temperatures were about evenly divided; the daily variations were as follows: normal on the 4th, 6th, 9th, 11th, 12th, 20th, 21st, 23d, 27th, and 28th; abnormally high on the 1st, 2d, 3d, 7th, 8th, 10th 13th, 24th, 25th, and 26th; abnormally low on the 5th, 14th to 19th, 22d, 29th, 30th, and 31st.

The heavy and continuous rains in connection with the abnormally high temperatures during the first part of the month were favorable conditions under which vegetation obtained an early start. The average monthly rainfall, 3.15 inches, as compared with the official records at eleven stations of the Signal Service within and adjacent to the state, shows a deficiency of 2.85 inches.

The following is an extract from the March, 1887, report of the "Ohio Meteorological Bureau," Prof. B. F. Thomas, of the Ohio State University, Columbus, president:

The weather for the month presented no very marked departures from the records for the same month in preceding years. The mean barometric pressure was 30.05 inches, agreeing with the average. The highest pressure, 30.68 inches, was recorded on the 4th, following the cold wave of the 3d. This is our highest March record.

The temperature for the month was unusually steady. The mean was, 35°.8, with a range between the maximum of 75° on the 2d, and the minimum of 5°.5 on the 29th. This range of 69°.5 is smaller by 7° than in any preceding March. Cold waves occurred on the 3d and 28th. The above mean temperature is 2°.4 below the normal, but our five-year average for March is 1°.1 lower still.

The mean rainfall was 2.23 inches, .06 below the average, and 1.14 below the normal. General rains occurred on the 5th, 6th, 9th, 21st, 22d, 27th, and 28th, the heaviest fall being recorded on the 5th and 6th.

The following is from the March, 1887, report of the "Oregon Weather Service," in charge of B. S. Pague, Private, Signal Corps, Roseburg:

Temperature.—The temperature has been above the normal throughout the state. A warm wave spread over the state on the 22d; the highest temperature recorded was 81°, at Roseburg. In the northern part of the state the coldest weather was from the 1st to 5th; in the southern part from the 17th to 21st. The lowest temperature was 23°, at Linkville, on the 18th.

Rainfall.—The rainfall has been above the average from the Calapooia Mountain to the Columbia River, and below the average thence to the southern boundary. From the 3d to 6th, heavy rain fell from Roseburg northward; from the 1st to 15th it was generally rainy throughout the state; from the 16th to the end of the month an occasional light rain fell.

Winds.—The winds were southerly along the Columbia and through the Willamette Valley; northwesterly in the Umpqua Valley; and southerly in the Rogue River Valley. Severe gales prevailed on the 11th along the coast and interior valleys, and on the 28th in the vicinity of Portland.

The following is from the March, 1887, report of the "South

Carolina Weather Service," Hon. A. P. Butler, Commissioner of Agriculture for South Carolina, director:

The month has been cool and dry, with temperature and rainfall both below the average. At Charleston the mean temperature was 54°.8, or 2°.4 below the mean of the last sixteen years, and the total rainfall was only .50 inch, or 3.68 inches less than the average for the same period.

The mean temperature for the entire state was 51°.4, or 1°.2 lower than that of the preceding month. The average rainfall was 1.85 inches, being 1.56 inches less than that for February.

The opening days of the month were warm and pleasant, but after the general rains which occurred on the 8th and 9th cool west to northwest and north winds set in and continued with more or less regularity until the 20th. After that date the winds became variable and there was a gradual increase of temperature until the 28th, when a sudden fall occurred and the northwest winds again predominated.

As a whole the month was unfavorable for truck gardening and fruit growing interests, the cool winds referred to having chilled the plants and stunted their growth.

The heaviest rainfall of the month occurred throughout the state on the 8th and 9th, and was accompanied by a marked decrease of temperature, these conditions probably causing the formation of the area of low barometer which appeared off the North Carolina coast on the 9th, and which moved slowly northeastward along the coast until the 11th, when it reached Nova Scotia. The northwest and west winds which prevailed over our state until the 20th were due to the presence of an extensive area of low barometer central over the Atlantic Ocean and off the coasts of New England and Nova Scotia from the 11th to the 20th.

During the 21st an area of low barometer passed within the limits of our state. This storm developed in Louisiana on the 20th and passed eastward along the Gulf coast into southern Georgia; thence northeastward along the South Carolina coast during the 21st. The storm increased in severity during its northeasterly movement and caused violent winds on the middle Atlantic and New England coasts. It was followed in this state by brisk west and north winds and clear weather.

The temperature fell suddenly in our state during the night of the 28th, the reports showing a decrease in temperature of 25° to 30° between 2 p. m. of the 28th and the same hour on the 29th.

The following telegram from the Chief Signal Officer of the Army, at Washington, D. C., was received at Columbia at 11.30 a. m. on the 28th:

"WASHINGTON, D. C., *March* 28.

"*To Observer, Columbia, S. C.:*

"Hoist cold-wave signal. The temperature will probably fall suddenly twenty degrees by 7 a. m. Tuesday.

"(Signed) GREELY."

A few minutes later the following was received:

"WASHINGTON, D. C., *March* 28.

"*To Observer, Columbia, S. C.:*

"Severe frosts are expected in the interior of South Carolina, Georgia, and Alabama on the morning of the 29th.

"(Signed) GREELY."

This information was immediately distributed, through the co-operation of the railroads and by special telegrams, throughout the state, so that at 1 p. m., or several hours in advance of the cold wave, by energetic effort on the part of those whose interests were liable to damage by frost, preparation could have been made to protect plants, gardens, etc. An examination of the reports from display stations shows that this warning was of great benefit to many people, and that such preparations were made, and with successful results, many gardens of early vegetables having been saved from injury.

Summary.

Mean temperature, 51°.4; highest temperature, 82°, at Columbia and Spartanburg, on the 2d; lowest temperature, 23°, at Spartanburg, on the 19th; range of temperature, 59°; greatest daily range of temperature, 43°, at Florence, on the 1st; Cheraw, on the 2d; and Spartanburg, on the 26th; least daily range of temperature, 2°, at Newberry, on the 5th.

Mean daily rainfall, 1.85 inches; greatest monthly rainfall, 3.89 inches, at Abbeville; Least monthly rainfall, 0.50 inches, at Charleston; greatest daily rainfall, 1.47 inches, at Bennettsville, on the 8–9th; date of heaviest rainfall throughout the state, 9th. Average number of rainy days, 7.

The following is an extract from the "Tennessee State Board of Health Bulletin" for March, 1887, prepared under the direction of J. D. Plunkett, M. D., President of the State Board of Health. The weather report is prepared by H. C. Bate, Director of the State Meteorological Service:

The mean temperature for March was 49°, slightly above the normal. The highest temperature was 77°, recorded on the 1st and 26th, and was the lowest maximum reported in the five years beginning with 1883. The lowest temperature was 18°, recorded on the 29th, and was the highest minimum reported in the period above-named, the lowest being 5°, reported in 1885. The mean daily range of temperature was very nearly normal.

The state was visited by three cold waves during the month, viz., on the 3–4th, 13–14th, and 27–28th; the predictions of which were all fully verified, the temperature reaching even 5° to 15° below the predictions.

The mean rainfall was 3.79 inches, slightly below the normal, and nearly two inches below the mean of the past five years in March. Of this amount the eastern division received an average of nearly three and three-fourths inches; the middle division nearly four inches, and the western division a little more than three and a half inches. The greatest rainfall was 5.41 inches, reported at Florence Station, and the least was 1.60 inches, reported at Fostoria. The days of the greatest rainfall were the 4th, 6th, 7th, 9th, and 27th; of these, the greatest fall occurred on the 6th, when an average of 1.11 inches fell throughout the state. The greatest local daily rainfall occurred at Florence Station on the 6th, and measured 2.85 inches. But few of the rains were general. Those on the 14th, 17th, 18th, 21st, and 28th were reported with snow; most of them were light and partial. The 1st, 2d, 10th, 11th, 12th, 13th, 15th, 24th, 25th, and 26th were reported without rain. Snow fell in various parts of the state on the 14th, 17th, 18th, 21st, and 28th; most of these falls were very light; the greatest depth reported was at Fostoria, 2 inches.

Summary.

Mean temperature, 49°.0; range of temperature, 59°; mean monthly range of temperature, 49°.5; greatest monthly range of temperature, 56°, at Greeneville and Hohenwald; least monthly range of temperature, 42°, at Covington; mean daily range of temperature, 16°.8; greatest daily range of temperature, 42°, on the 1st, at Grief, and on the 12th, at Hohenwald; least daily range, 1°, on the 4th, at Riddleton, and on the 20th, at Trenton; mean of maximum temperatures, 74°.0; mean of minimum temperatures, 24°.5.

Average number of clear days, 13.4; average number of fair days, 6.7; average number of cloudy days, 10.9; average number of days on which rain or snow fell, 9.4.

Warmest day, 26th; coldest day, 29th.

Prevailing direction of wind, northwest.

METEOROLOGICAL NOTES.

AVERAGE STORM TRACKS FOR THE MONTH OF MARCH.

[By 2d Lieut. FRANK GREENE, Signal Corps, U. S. Army, Assistant.]

In the construction of chart number vii, showing the average storm tracks for the month of March, ninety-nine storm tracks have been considered, the storms occurring in the years from 1873 to 1885. Only those storms were considered whose paths clearly laid within the limits of observation in the United States. Many tracks that only skirted the northern boundary of the United States were not considered, because, owing to the sparsity of stations of observation in the British Provinces, the exact location of the storm-centre was not clearly defined.

Upon examination it is found that these storm-centres pursued, in a general way, paths of such similarity that they may be said to be divided into four classes, the path of each class being distinct and different from the others, and readily discerned.

These paths, as shown on the chart, are designated by the letters *A A*, *B B*, *C C*, *D D*, with secondary paths, *A aa′*, *B bb′*, *C cc′*.

A A. These storms first appear near the northern boundary of the United States, about the one hundred and tenth meridian west from Greenwich, and move southeastward through Montana and Dakota, passing then eastward near the latitude of Saint Paul, Minn., thence crossing Lakes Michigan and Huron, move down the Saint Lawrence Valley, disappearing generally off the Nova Scotian coast. A smaller number, *A aa′*, after following the general direction *A A*, appear to be deflected more to the south after passing Saint Paul, and moving down over Lake Erie disappear to the east of Delaware Bay.

B B. These storms are first noticed in Montana about the one hundred and seventh meridian west from Greenwich, and at once take a more southerly course, southeastward through Nebraska and northern Kansas, passing eastward near Saint Louis, thence inclining gradually to the northward, moving up the Ohio Valley along the southern edge of Lakes Erie and Ontario, and moving down the Saint Lawrence Valley, disappearing near its mouth. A smaller number after first following the general course *B B*, continue in a direct east course after passing Saint Louis, and pass to the eastward, disappearing near the mouth of Delaware Bay.

C C. These storms are first noticed in northwestern Texas between latitudes 32° and 35° N., near the one hundredth meridian west, one portion moving in a dirction a little north of east through Arkansas, Tennessee, and southern Virginia, passing off into the Atlantic Ocean south of Norfolk, Va. A slightly greater number, *C cc′*, take at once a course in a nearly direct northeast line through the Indian Territory, Missouri, Illinois, the lower part of eastern Michigan, and following the Saint Lawrence Valley disappear in the Atlantic Ocean near Newfoundland.

D D. These storms appear to originate in the western part of the Gulf of Mexico, in the vicinity of Galveston, Tex., and in general move in a direct northeast course through Louisiana, Mississippi, northern Alabama, east Tennessee, following the trend of the Blue Ridge Mountains and skirting the southern coast of New England, disappear in the Atlantic Ocean about the southern shores of Nova Scotia. Very rarely storms appearing in the Gulf of Mexico are apparently pressed southward by the influence of an area of high barometric